

An Application of the Learning Cycle in Health Education: HIV/AIDS Prevention

Tania Barman Basta and Charles R. Barman

ABSTRACT

Objectives: At the conclusion of this lesson, students will be able to (1) identify methods of contraception that are the least/most effective for HIV/AIDS prevention, (2) describe modes of HIV/AIDS transmission, (3) demonstrate proper condom use, and (4) describe the consequences of unprotected sexual behavior. **Target Audience:** Students enrolled in high school or college-level courses related to health.

INTRODUCTION

Many misconceptions exist among adolescents regarding the transmission of, and appropriate contraception methods to prevent, HIV/AIDS.¹⁻³ To combat these misconceptions, students should be taught to think critically about the consequences that frequently accompany decisions related to this health issue. One method of incorporating such strategies is through the use of the learning cycle teaching model, first developed in the 1960s.⁴ The most recent version of this model includes four phases: engagement, investigation, dialogue, and application⁵ (Figure 1).

In the first phase of the learning cycle, engagement, strategies are used to help students identify and reveal their preconceptions—correct or mistaken—about an issue. All reasonable student responses should be accepted without judgment. During the investigation phase, students are presented with a problem or a task related to an issue. The problem or task should be open-ended enough to encourage students to pursue a range of strategies, yet specific enough to provide some direction. Activities used in this phase provide a basis for students to question their current ideas about the subject and form a framework for developing new concepts and related vocabulary. In the

dialogue phase, the teacher engages students in discussion about findings and questions based on the investigation. Students are encouraged to seek additional information in multiple ways and reflect on how this process has changed their prior knowledge. In the last segment, application, students are either presented with additional examples of the lesson's main concept or challenged with a new task that can be solved with information obtained during the previous phases. Ideally, one or more of the application experiences will be directly relatable to the students' daily lives.

The following lesson uses the learning cycle approach to promote critical thinking skills specific to HIV/AIDS transmission and appropriate contraception practices. Although some of the activities in this lesson have been used in other lessons, they are being used in this article to illustrate how certain strategies fit within specific phases of a given learning model.

OBJECTIVES

At the conclusion of this lesson, students will be able to:

1. identify the methods of contraception that are the least/most effective for HIV/AIDS prevention;

2. describe the modes of HIV/AIDS transmission;
3. demonstrate proper condom use; and
4. describe the consequences of unprotected sexual behavior.

MATERIALS

- 3 x 5" blank note cards
- Model penis
- One note card with a red dot in a back corner
- Latex and lambskin condoms
- Various contraceptives devices (e.g., spermicides, diaphragm, oral contraceptives, the patch, nuva ring, depo-provera, dental dam)

TARGET AUDIENCE

Although this lesson is aimed at college

Tania Barman Basta is an assistant professor in the School of Health Sciences, Ohio University, Grover Center E331, Athens, OH 45701; E-mail: basta@ohio.edu. Charles R. Barman is a professor of science education and director of the Urban Center for the Advancement of STEM Education (UCASE), School of Education, Indiana University-Purdue University Indianapolis, 902 W. New York St., Indianapolis, IN 46202.



students, it could be adapted and used in high school classrooms. Caution should be exercised when dealing with specific controversial issues, however, since certain information may not be appropriate for some secondary and college settings.

PROCEDURE

Engagement

1. Begin by asking students to predict how many people in the room are at risk of contracting HIV/AIDS if only one person in the room has HIV/AIDS.

2. Instruct students to obtain signatures on their index cards from four classmates. When everyone has four signatures, determine which student has the red dot on the back of his/her card.

3. Write that student's name on the board, then ask him/her to write the four names from his/her card onto the board as well.

4. Draw a line connecting the four names to the name of the red-dot student.

5. After these first five names are written on the board, the next student to go to the board will be someone who has one or more of these names (red-dot student plus his/her four signatures) on his/her index card. This student will connect his/her name to one or more of the others, thus creating a web of names on the board. This will continue until all students have had a chance to connect themselves to others on the board. Depending on the size of the class, there may be some students who do not have connections to any of the students on the board.

6. Inform students that the individual with the red dot is infected with HIV and that he/she has kissed each of the four people on his/her index card. Ask students how many of the individuals on the board could have been infected with HIV via kissing (without explaining to them yet that there is no risk of HIV transmission via kissing).

7. After the kissing discussion, announce that each student has had sexual intercourse with the four people on his/her index card. Ask students how many individuals on the board could have been infected with HIV via sexual

intercourse. This activity can be continued with the red dot representing intravenous drug use, hugging, oral intercourse, and so on.

Instructors should be armed with certain basic facts about HIV/AIDS. Although these facts should not be shared with students during the engagement phase, they can be used to clear up misconceptions later in the learning process if necessary:

- Not all individuals who have sexual intercourse with an HIV/AIDS-infected individual will themselves become infected with HIV, but all are at risk for such infection.
- HIV is transmitted via blood, semen, vaginal fluids, and breast milk.⁶ There is no risk of contracting HIV from hugging someone infected with the disease.
- The behaviors that are most risky for HIV transmission are unprotected anal, vaginal, and oral intercourse; anal is the riskiest because the anal lining is easily torn.
- Intravenous drug use is another risky behavior if needles are being shared.
- HIV can also be transmitted via breastfeeding from an infected mother to her child.

Investigation

1. Ask students to discuss the consequences of unprotected sexual behavior (e.g., HIV and other sexually transmitted infections; unintended pregnancy; as above, these facts should not be shared with students at this point in the lesson).

2. Require students to hypothesize about which contraceptive methods/devices are most and least appropriate for HIV prevention. (More facts for instructors: abstinence is the most effective method of contraception, followed by latex condoms and dental dams for oral sex with a woman. Latex condoms are the sole barrier method that has been proven to protect against HIV transmission. All other methods place an individual at risk for HIV.)⁷ You should have these devices available for students' viewing.

3. Ask students to brainstorm what they believe are the 10 steps for properly putting on a condom. In order for students to come up with answers that will ultimately facilitate a dialogue among students and teacher, it is imperative that students are given time to in-

vestigate with their classmates or on their own. Allow students to interact with various types of contraceptive devices. For example, have a model penis/vagina available for students to practice placing various contraceptive devices on as well as allow students time to gather information about contraception via other methods (e.g. internet or library).

Dialogue

1. Give students time to discuss the questions and answers they came up with during the investigation phase, along with key terms such as infectious disease, STIs, HIV, AIDS, condoms, dental dam, and communicable disease. (Although students will have encountered many of these terms in previous portions of the lesson, this will be an opportunity to define them more formally and clear up any remaining misconceptions students may have developed during their own research). Also use this time to educate students about the consequences of unprotected sexual behavior as well as the prevalence and incidence rates of HIV/AIDS, both globally and nationally (e.g., in 2007, an estimated 33.2 million individuals were living with AIDS worldwide, and another 2.5 million became newly infected⁸; in 2003, over a million Americans were estimated to be living with HIV/AIDS, with 40,000 new infections occurring in the United States every year⁹; currently, minority heterosexual women are the fastest growing population of infected in the country).¹⁰

2. Give students a list of the 10 recommended steps for proper condom use, adapted from a list originally created by Advocates for Youth¹¹ (Table 1). Instruct students to demonstrate those steps using the model penis.

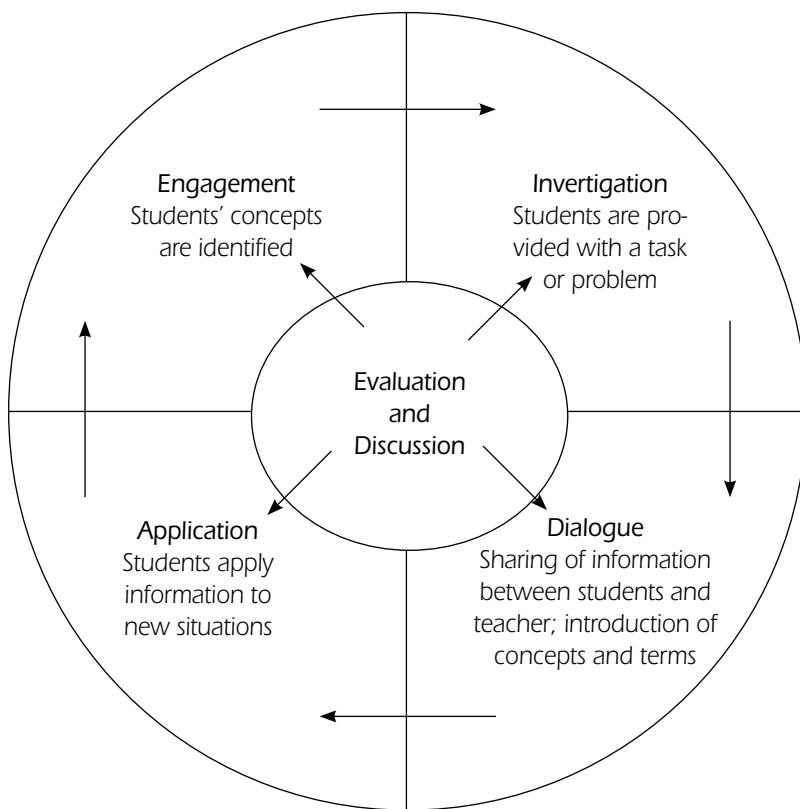
Application

As a culminating experience, ask students to write a paper about the consequences of risky sexual behavior, HIV transmission routes, and appropriate contraceptive methods to prevent infection. These papers will be shared with other students at the next class meeting and considered for possible submission to the school's website or newspaper. Explain that the paper should be age appropriate for their particular college or high school target audience.

**Table 1. Ten Steps to Correct Condom Use**

1. Discuss safer sex with your partner.
2. Purchase condoms.
3. Open condom package, avoiding the use of sharp objects (teeth, nails, jewelry).
4. Wait until penis is erect; squeeze tip of condom and place rolled condom on head of penis.
5. Leave a half inch space at the tip of the condom to collect semen.
6. Hold tip of penis and unroll condom until penis is completely covered.
7. After ejaculation, while the penis is still erect, hold condom at the base of the penis while extracting the penis from your partner's body.
8. Carefully remove condom without spilling any semen.
9. Wrap condom in a tissue and throw away (do not flush down toilet).
10. Do not reuse condom. Use a new condom for every act of oral, anal, or vaginal intercourse.

Source: Advocates for Youth (2007)¹¹

Figure 1. Four-Phase Learning Cycle

Source: Barman (1997)⁵

ASSESSMENT TECHNIQUE

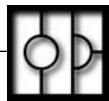
Although Figure 1 indicates that evaluation can occur in any of the phases, this

specific application activity serves as an excellent means of formative and summative assessment. Grading for this lesson should

focus on class participation as well as the accuracy of the information contained in the final paper.

REFERENCES

1. Cohall A, Kassotis J, Parks R, Vaughan R, et al. Adolescents in the age of AIDS: myths, misconceptions, and misunderstandings regarding sexually transmitted infections. *JAMA*. 2001;285:64-69.
2. Crosby R, Newman D, Kamb ML, Zenilman J. Misconceptions about STD-protective behavior. *Am J Prev Med*. 2000;19:167-173.
3. Torabi M, Jeng I. Trends and public knowledge and attitudes related to HIV/AIDS in Indiana. *American Journal of Health Studies*. 1999;15:203-216.
4. SCIS Teachers Handbook. Berkeley, CA: University of California; 1974.
5. Barman C. *The Learning Cycle Revisited: A Modification of an Effective Teaching Model*. Washington, DC: Council for Elementary Science International; 1997.
6. Centers for Disease Control and Prevention. HIV and its transmission (fact sheet). Available at: <http://www.cdc.gov/hiv/resources/factsheets/transmission.htm>. Accessed January 22, 2008.
7. Boston Women's Health Book Collective. *Our Bodies, Ourselves: A New Edition for a New Era*. New York, NY: Touchstone; 2005.
8. World Health Organization. Global HIV prevalence has leveled off (fact sheet). Available at: <http://www.who.int/mediacentre/news/releases/2007/pr61/en/index.html>. Accessed January 17, 2008.
9. Centers for Disease Control and Prevention. A glance at the HIV/AIDS epidemic (fact sheet). Available at: <http://www.cdc.gov/hiv/resources/factsheets/At-A-Glance.htm>. Accessed January 17, 2008.
10. Centers for Disease Control and Prevention. HIV/AIDS among women (fact sheet). Available at: <http://www.cdc.gov/hiv/topics/women/resources/factsheets/women.htm>. Accessed January 14, 2008.
11. Advocates for Youth. 12 steps to putting on a condom. Available at: <http://www.advocatesforyouth.org/youth/health/safersex/condom.htm>. Accessed October 11, 2007.



Improving Health Information Literacy: An Environmental Health Application

Ying Li and Lorrie Brilla

ABSTRACT

Objectives: After this lesson, students should be able to (1) identify possible problems associated with online information; (2) define health information literacy; and (3) list at least three criteria to evaluate the quality of websites related to health information literacy. **Target Audience:** High school and lower-division college students.

INTRODUCTION

With increased accessibility to the internet, more people are going online to retrieve health information. Recently, it was reported that 80% of American internet users have searched the web for health information.¹ No doubt, there are many benefits associated with consumer online health information searches, such as easy, fast, and cost-effective access to health information. At the same time, the lack of peer review and regulation, especially with regard to validity, has caused concerns over the quality of online health information.²

One of the most important means of determining the accuracy of health information requires consumers to compare different health-related websites on common topics.³ Yet, users typically focus on finding information quickly rather than on evaluating it for accuracy.

Among college age students, research results indicate that many are not competent to evaluate information from websites, which, in turn, may limit their ability to make informed health choices.³ In general, students know little about information

sources, including the substantive distinctions between primary versus secondary sources, articles versus books, commercial versus noncommercial materials, and opinion pieces versus empirical studies. Individuals who do not understand these distinctions are likely to engage in information searching that is shallow and superficial.³ In addition to knowing little about the quality of information sources, very few internet users check the source of, or data within, the information they find online.¹ This reality indicates the need for teaching students health information literacy.

Health information literacy involves properly obtaining, reading, understanding, and acting on basic health information; effective implementation of each of these stages is necessary to making good health decisions.⁴ Through readings and discussions about global warming, as well as watching Al Gore's Academy Award-winning documentary *An Inconvenient Truth*, this teaching idea is designed to help students understand health information literacy and give them proper tools to improve their abilities thereof.

OBJECTIVES

By participating in the class activities, students will be able to:

1. identify possible problems associated with online information;
2. define health information literacy as promulgated in National Health Education Standard 3⁵; and
3. list at least three criteria to evaluate the quality of a website with regard to health information literacy.

MATERIALS AND RESOURCES

Each student will have seen the movie *An Inconvenient Truth* or have access to a trailer for the film. Each student will be given a copy of two articles: "Scientists Respond to Gore's Warnings of Climate Catastrophe"⁶ (Figure 1) and "Al Gore's 'Inconvenient

Ying Li is an assistant professor in the Physical Education, Health, and Recreation Department, Western Washington University, MS-9067, 516 High St., Bellingham, WA 98225; E-mail: ying.li@wwu.edu. Lorrie Brilla is a professor in the department.

**Table 1. Website Evaluation Rubric**

Criteria	Questions to ask	Things to look for	Points (1–5)*
Overall visual appeal	Is the website organized from the users' perspective? Is the website's design and layout straightforward and concise? Is white space sufficient?	Appropriate and thematic graphic elements are used to make visual connections that contribute to the understanding of concepts, ideas and relationships. Differences in type size and/or color are used well and consistently.	
Identification of developers and sponsors	Who developed the website, and for what purpose? Is the information appropriate for the intended purpose?	The contact information of the webmaster and the organization behind the website should be displayed clearly throughout the website. The identities of the funding sponsors should be disclosed to the public. The stated purpose or mission should not conflict with what is done. Note the web address (.com, .org, .gov).	
Qualifications of authors	Who wrote the article? Does the author have proper training in the field? Are the author(s)/organization(s) recognized in the field?	Any advice provided on the site will only be given by properly trained and qualified professionals. Otherwise, it should be clearly stated.	
Quality of published information	Is the information supported by references to source data? How often is the information updated? Is the information consistent with other resources? Is the information based on scientific data?	Good websites should cite published sources of information, for people to seek further information. The website should be current and updated regularly and the links (if any) also should be up-to-date. The information provided on the website should be designed to support, not replace the professional sources. Coverage, accuracy, currency, readability, and quality are essential components.	
Privacy and confidentiality of personal data	How is the privacy and confidentiality of any personal information collected from users protected?	The authors of the website should describe how they treat confidential, private or semi-private information such as email addresses. Visible on the site should be information on how these data are treated. More than necessary personal information should not be asked of visitors. (sites do not describe, inform, or ask).	
		Total Points**:	

*Assign points based on how you believe the website meets the criteria, using the following scale:

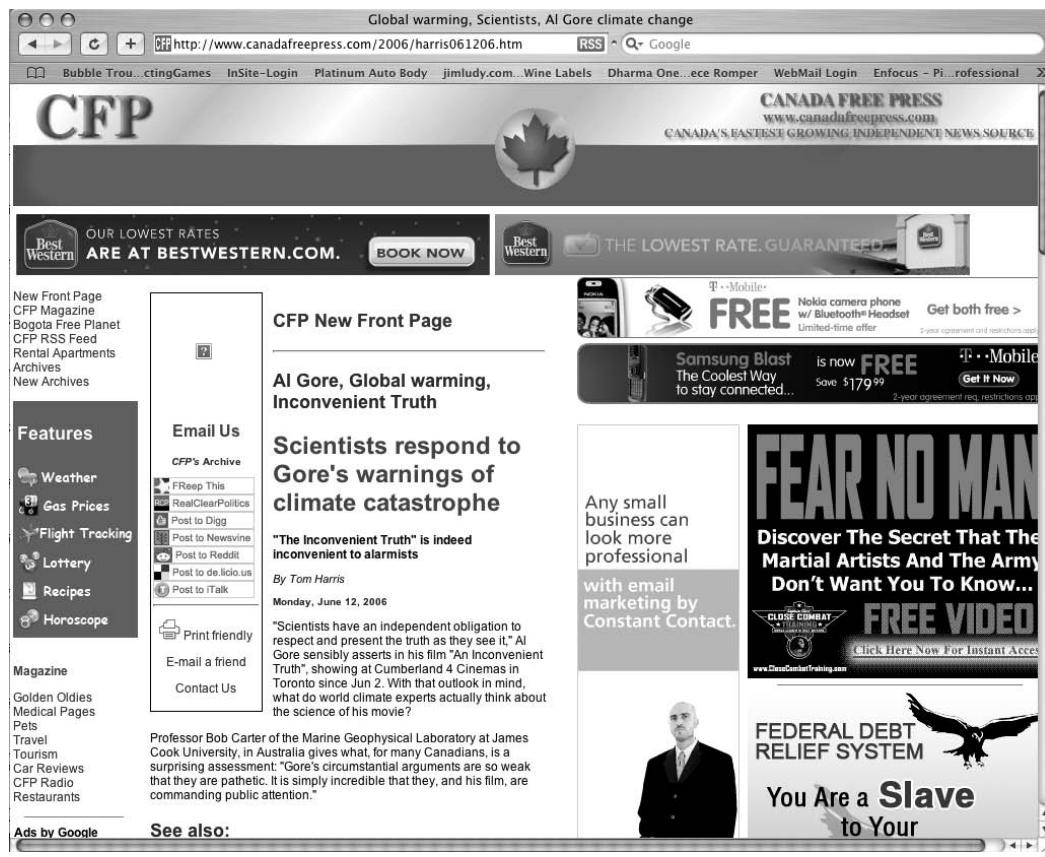
- 1 = minimally
- 2 = somewhat
- 3 = average
- 4 = above average
- 5 = completely

**Determine the overall quality of the website based on the total points:

- 20–25 = website that you likely can trust
- 15–19 = good website that you may trust
- 10–14 = somewhat okay website whose information you should be careful of
- 0–9 = likely poor website that you should not trust

Sources: See References 9–14.

Figure 1. Online Article Sample: “Scientists Respond to Gore’s Warnings”



Truth’ Movie: Fact or Hype?”⁷ (Figure 2). Students also will receive a copy of the website evaluation rubric (Table 1), preferably through a class management platform such as Blackboard. The classroom should be equipped with an overhead projector or flipchart and electronic presentation equipment (i.e., computer, projector, and internet connection).

TARGET POPULATION

This activity is designed for high school and lower-division college students. It is also appropriate for students at the middle school level.

PROCEDURE

Although this activity was designed as part of a consumer health curriculum, it also can be used in a regular health class with a wellness orientation. Without consideration

for pre-class reading activities (described in the next paragraph), this lesson will take about 50 minutes—or two-and-a-half hours if the instructor prefers to have students watch *An Inconvenient Truth* in its entirety during class. As an alternative to watching the entire movie, the instructor may offer an in-class, two-and-a-half-minute review of a trailer.⁸

In addition the trailer or movie, students will be required to read two opposing perspectives. Individually, via Blackboard outside of class time, students will be required to read the web article “Scientists Respond to Gore’s Warnings of Climate Catastrophe”⁶ and assess it via the rubric (Table 1). Basically, the article challenges the credibility of the movie and the existence of global warming. Students should be directed to the “about us” sections of websites to learn about the authors or owners of the sites and review

disclaimers and disclosure statements. The same procedure should be used to assess a second article, “Al Gore’s ‘Inconvenient Truth’ Movie: Fact or Hype?”⁶

The instructor should also take 5–10 minutes in class to ask students about their responses to the film, including what they learned from it and how it could change their behaviors regarding the topic of global warming. At the end of the discussion, students should be asked whether they challenged the credibility of the movie while watching it or in the process of reflecting upon it. The instructor should then ask them to reflect on why they did or did not challenge the information.

Next, the instructor can elicit feedback from students about the “Scientists Respond” article. The instructor should inquire whether students “believe this article,” “don’t believe this article,” or “don’t know,”



Figure 2. Online Article Sample: "Inconvenient Truth' Fact or Hype?"

The screenshot shows a Microsoft Internet Explorer window displaying the National Geographic News website. The main article is titled "Al Gore's 'Inconvenient Truth' Movie: Fact or Hype?". The article discusses the movie's message about global warming and quotes an earth scientist. The page includes a sidebar with news feeds, a podcast, and a free newsletter sign-up. The right side of the page features a sidebar with "TODAY'S BEST NEWS PHOTO", "VIDEO IN THE NEWS", "TODAY'S MOST POPULAR NEWS STORY", an advertisement for "UPGRADES AND LUXURIOUS AMENITIES AWAITS", and "LATEST PHOTOS IN THE NEWS". The bottom of the page shows the Windows taskbar with various open applications.

recording responses for all students to see. The instructor should encourage students in each category to volunteer their justifications for their stance. Students should also be asked whether, after reading the article, their beliefs about the movie changed. After students voluntarily share their comments, the instructor should repeat the same process used for critiquing the first article to the "Fact or Hype" article. The instructor should end the discussion by acknowledging that confusion exists among the general populace regarding which view to believe. The instructor also may share with students some other conflicting information found online and explain that lack of validity often accompanies online information.

Finally, the instructor should introduce students to the concept of health information literacy and explain why it is important for consumers. The instructor should then

discuss each criterion in the rubric (Table 1), highlighting problems associated with the first article (e.g., unrelated advertisements taking more space than the article; the purpose of the website and the identity of its developers is unclear; the author is associated with an organization supported by oil companies; the information provided is more like opinion than scientific fact). To identify these problems, the instructor will need to navigate the website and do a search about the author of that article to determine any conflicts of interest. The instructor should demonstrate and explain the purpose of each step. The instructor should conduct a similar website analysis for the second article, noting its positive aspects with regard to validity (e.g., its source—the National Geographic Society—is a reputable nonprofit scientific and educational organization with a clear mission; the article

has a neutral tone; two points of view and sources for further information are given; the contributors are trained professionals in the field).

ASSESSMENT TECHNIQUE

After the in-class lesson, students should be required to reassess the websites with the foundation provided by the class activities. This pre and post qualitative analysis may help them toward a beneficial self-analysis of their health information literacy skills. Impact evaluation of student learning can be assessed through administration of a short quiz at the beginning and end of the lesson. Questions on the quiz may include: (1) Define health information literacy; (2) List two reasons why it is important to have health information literacy; (3) List at least three criteria to evaluate online information as related to health information literacy.



REFERENCES

1. Pew Internet and American Life Project. Online health search 2006. Available at: http://www.pewinternet.org/pdfs/PIP_Online_Health_2006.pdf. Accessed June 28, 2007.
2. Cline RJ, Haynes KM. Consumer health information seeking on the internet: the state of the art. *Health Educ Res*. 2001;16:671-692.
3. Ivanitskaya L, O'Boyle I, Casey AM. Health information literacy and competencies of information age students: results from the interactive online Research Readiness Self-Assessment (RRSA). *J Med Internet Res*. 2006;8(2):e6. Available at: <http://www.jmir.org/2006/2/e6>.
4. Medical Library Association. Health information literacy. Available at: <http://www.mlanet.org/resources/healthlit/define.html>. Accessed June 28, 2007.
5. Joint Committee on National Health Standards. National health education standards. Available at: http://www.aahperd.org/aahe/pdf_files/standards.pdf. Accessed December 21, 2007.
6. Harris T. Scientists respond to Gore's warnings of climate catastrophe. Available at <http://www.canadafreepress.com/2006/harris061206.htm>. Accessed December 20, 2007.
7. Lovgren S. Al Gore's "Inconvenient Truth" movie: fact or hype? Available at: <http://news.nationalgeographic.com/news/2006/05/060524-global-warming.html>. Accessed August 10, 2007.
8. This trailer is available online at: <http://www.youtube.com/watch?v=wnjx6KETmi4>.
9. Massachusetts Institute of Technology. Usability guidelines. Available at: <http://web.mit.edu/is/usability/usability-guidelines.html>. Accessed July 6, 2007.
10. Health on the Net Foundation. HON code of conduct (HONcode) for medical and health web sites. Available at: <http://www.hon.ch/HONcode/Conduct.html>. Accessed July 6, 2007.
11. U.S. Department of Health and Human Services. Healthy people 2010. Available at: <http://www.healthypeople.gov/document/HTML/Volume1/11HealthCom.htm>. Accessed July 6, 2007.
12. Wyatt J. Commentary: measuring quality and impact of the world wide web. *Brit Med J*. 1997;314:1879.
13. Drolet JC, Fetro JV. *Applications for Personal and Social Competence*. Santa Cruz: CA: ETR Associations; 2000.
14. Kotecki JE, Chamness BE. A valid tool for evaluating health-related www sites. *J Health Educ*. 1999;30:56-59.